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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,972	02/18/2005	Christel Renate Schopfer	13173-00007-US	1455
23416 7590 05/23/2008 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899				
EXAMINER KALLIS, RUSSELL				
ART UNIT 1638		PAPER NUMBER		
MAIL DATE 05/23/2008		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/524,972

Applicant(s)

SCHOPFER ET AL.

Examiner

RUSSELL KALLIS

Art Unit

1638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12-35 and 60-100 is/are pending in the application.
4a) Of the above claim(s) 10, 11 and 36-59 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-9, 12-35, 60-78 and 80-100 is/are rejected.
7) ☒ Claim(s) 79 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 18 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Final Drawing Review (PTO-849)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claims 1-100 are pending. Claims 10-11 and 36-59 are withdrawn as being drawn to non-elected inventions. Claims 1-9, 12-35 and 60-100 are examined.

Claim Rejections - 35 USC § 103

Claims 1-9, 12-35, 60-78 and 80-100 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Mann V. et al. Biotechnology; August 2000, Vol. 18 pages 888-892 in view Shewmaker C. WO 99/07867 published 18 February 1999 and in further view of U.S Patent application publication 2004/0176570 filed April 10, 2002, Sandmann, G. *et al.* Archives of Biochemistry and Biophysics: Minireview; Jan. 1, 2001; Vol. 385, No. 1, and Applicant's admissions of the prior art in the specification. This rejection is maintained for the reasons of record set forth in the Official action mailed 8/27/2007. Applicant's arguments filed 2/27/2008 have been considered but are not deemed persuasive.

Applicants urge that Mann does not teach or suggest targeting expression to petals of plants (response page 27). Contrary to Applicants' assertion, Mann states that the production of astaxanthin in the carotenoid bearing petals of marigold flowers is an attractive source for the commercial production of astaxanthin, a keto-carotenoid (page 890 column 2 last paragraph to page 891 line 2).

Applicants assert that there is no reasonable expectation of success to produce ketocarotenoids in marigold petals in using the chimeric gene construct comprising the tomato *PDS* promoter fragment of bases 1-459, the transit peptide encoding sequence that imports proteins into chloroplasts, and the coding sequence for the *CrtO* β -carotene ketolase polypeptide isolated from the alga *Haematococcus pluvialis*, i.e. SEQ ID NO: 1, because when this construct was expressed in tobacco it expressed in the nectaries and not the petals. Applicant is reminded that the construct utilizes a transit peptide for importing the polypeptide into the chloroplast, and of what is commonly known in the art, which is that chloroplasts are found in the nectaries of tobacco (see Mann page 890 column 2 Discussion 1st paragraph especially lines 9-13) and in the colored flowers of many plant species (i.e. in the petals of marigold); and thus one of ordinary skill would have appreciated this fact and had a reasonable expectation of success of engineering the production of keto-carotenoids in the petals of marigold.

Applicants' assertion that the reference does not state 'flower petals' with respect to marigold (response page 28) is not well founded because the reference does state "Converting flower carotenoids in *Tagetes* to astaxanthin by metabolic engineering could provide an abundant source for this pigment', and 'The content of carotenoids in petals of *Tagetes* can reach 5,700 micrograms per gram fresh weight or ~5% dry weight' (page 890 column 2 last paragraph to page 891 line 2), which one of ordinary skill would appreciate flower to encompass petal because it is common knowledge that petals are flower parts i.e. flower petals and by the teaching of Mann that the flower petal of Marigold (i.e. *Tagetes*) is where the substrate for making astaxanthin by metabolic engineering is to be found.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Claims 1-9, 12-35, 60-78 and 80-100 remain rejected.

Claim 79 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RUSSELL KALLIS whose telephone number is (571)272-0798. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Russell Kallis/
Primary Examiner, Art Unit 1638
May 21, 2008